Evaluating Methods of Calculating the Fixed Fee on Professional Service Contracts

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Gary Schneider
Program Manager/Contract Negotiator
South Carolina Department of Transportation

INTRODUCTION/PROBLEM STATEMENT:

The South Carolina Department of Transportation (SCDOT) routinely retains Professional Consulting Engineering firms to provide engineering design and related professional services for the preparation of construction plans or design-build Request for Proposal (RFP) bid packages for a wide variety of Federal-aid Highway Program (FAHP) roadway and bridge construction projects throughout South Carolina. These professional services are generally retained when:

1. Schedule: A given project needs to be expedited but SCDOT's current engineering staff is assigned to other projects and reassignment would jeopardize the schedule of those projects;

2. Workload: SCDOT's internal workload may be larger than normal or anticipated to be larger for future years and staff augmentation would serve no benefit over a short time span; or

3. Magnitude, Complexity and/or Special Expertise: The character of a project requires specialized knowledge, expertise or experience beyond the capacity of the scope of SCDOT staff. [Department Directive (DD)-41]

When such professional services are needed SCDOT utilizes a qualifications-based selection process, in accordance with the Brooks Act (40 U.S.C. 1101-1104), for the acquisition of services from a consulting engineering firm. This selection process is carried out in accordance with the Federal Acquisition Regulations (FAR), Federal Highway Administration (FHWA) guidance, and the South Carolina Department of Transportation (SCDOT) Department Directive 41 (DD-41) which provides SCDOT policy and procedures for the acquisition of professional service contracts. This practice of outsourcing engineering services has been in place for many years and it also is a common practice in most other states as well.

The Brooks Act requires the selection of engineering and design related services on the basis of demonstrated competence and qualifications for the type of professional services required and then negotiation of "Fair and Reasonable" compensation. It is important to note that in the selection process, all price/cost related items including direct salaries/wage rates, indirect cost (overhead) rates, and other direct costs are prohibited from being considered in the evaluation and selection of the most highly qualified firm [as specified in 23 CFR 172.5(a)(1)].

Furthermore, the FHWA guidance states that: "Upon completion of a qualifications-based evaluation and ranking of proposals, the contracting agency initiates negotiations with the most highly qualified consulting engineering firm to arrive at fair and reasonable compensation for the solicited services which considers the scope, complexity, professional nature, and estimated value of the services to be rendered [as specified in 23 U.S.C. 112(b)(2)(A), 40 U.S.C. 1104, and 23 CFR 172.5(a)(1)]".

Given these requirements a key question to be considered is what constitutes "Fair and Reasonable" compensation to both parties (the State of South Carolina retaining the services and the private sector consulting engineering firm selected to perform the required engineering and related professional services), particularly in determining an appropriate "Fixed Fee" or "Operating Margin". There may be no simple answer as many factors are involved other than to say whatever both parties agree to as "Fair and Reasonable" compensation within the framework of the Brooks Act and related pertinent laws, regulations, policies and procedures.

The purpose of this Certified Public Manager (CPM) project is to examine the current process of determining a "Fair and Reasonable" fixed fee for professional service contracts and to evaluate possible alternative methods including practices in other states that may improve the process, particularly in light of the considerable variation in audited overhead rates among consulting firms. In reviewing such alternative methods particular attention will be given to evaluating the potential impact of the method as an incentive to consulting firms to effectively manage their overhead costs.

DATA COLLECTION:

To conduct this investigation, various data sources and policy and procedural manuals and guidebooks have been used to review practices and processes in a few other state transportation agencies including the Florida Department of Transportation (FDOT), North Carolina Department of Transportation (NCDOT), Tennessee Department of Transportation (TDOT) and Virginia Department of Transportation (VDOT). In addition, various professional service contracts for engineering design and related professional services executed by the South Carolina Department of Transportation during the period July 1, 2012 to June 30, 2015 (past 3 fiscal years) as available from the South Carolina Department of Transportation Professional Services Contracting Office have been examined.

Throughout this paper various terms are used as defined in Appendix A. Most of these terms and definitions have been taken from the Federal Highway Administration (FHWA), the American Association of State Highway and Transportation Officials (AASHTO) Guide for Consultant Contracting (March 2008), the American Association of State Highway and Transportations (AASHTO) Uniform Audit and Accounting Guide for Audits of Architectural and Engineering (A/E Consulting Firms (2012 Edition), and the SCDOT Manual for Procurement and Administration of Architectural and Engineering Services.

CURRENT SITUATION:

Each year the South Carolina Department of Transportation (SCDOT) enters into professional services contracts with various consulting engineering firms that provide engineering design and related professional services for the preparation of construction plans or the preparation of design build RFP packages for roadway and bridge construction projects that are funded with Federal-aid Highway Program (FAHP) funds.

In recent years SCDOT has entered into hundreds of contracts for engineering and related professional services (see Exhibit 1 from SCDOT database).

Exhibit 1: Professional Service Contracts Executed by Year		
Year	Number of Professional Service Contracts Executed	Total Contract Amount
2014	110	$54,236,441.20
2013	47	$42,487,146.10
2012	57	$27,057,593.88

In each contract negotiation the SCDOT and the selected engineering firm negotiate the scope of services to be performed first and then, based upon the final negotiated scope, the estimated cost for performing the required scope of services. Once the selected engineering firm and SCDOT agree on a definitive scope of services to be performed, both SCDOT and the selected consulting firm prepare independent cost estimates.

Under the established procedures (based on FHWA guidelines and regulations) SCDOT must first complete its internal estimate before the selected consulting firm is requested to submit its independent estimate. Estimates are prepared using a common estimating template that includes the listing of each task and subtask to be performed in accordance with the scope of work and proposed project schedule. The estimates are prepared by determining the staffing classifications needed to successfully perform each task and subtask and then estimating the number of staff-hours required by staffing classification to complete each task/subtask. The direct labor cost for each task is then calculated by multiplying the number of staff-hours for each staff classification by the direct hourly labor rate for that classification. After the direct labor amount is determined for all tasks, the selected firm's indirect cost (overhead) is calculated based on the selected firm's approved audited overhead rate.

An engineering consulting firm's indirect cost (overhead) rate is developed in accordance with the FAR cost principles (as specified in 23 U.S.C. 112(b)(2)(B), 23 CFR 172.7(a), and 48 CFR 31). This indirect cost rate is typically established for a one-year accounting period based on a FAR compliant audit of the firm's annual Statement of Direct Labor, Fringe Benefit and General Overhead with notes and related financial information in accordance with Generally Accepted Government Auditing Standards (GAGAS). In some cases, a contracting agency may have to perform a pre-negotiation audit to ensure that the consulting firm has an acceptable accounting system, has adequate and proper justification for the various rates charged to perform work, and is aware of cost eligibility and documentation requirements. In general a firm's "overhead rate" or "indirect cost rate" refers to a factor/ratio computed by adding together all of a firm's costs that cannot be associated with a single cost objective (e.g., general and administrative costs and fringe benefit costs), then dividing by a base value (usually direct labor cost) to determine a rate. While a firm may choose its accounting practices, those practices must meet applicable Federal requirements, including the FAR cost principles and applicable cost accounting standards. For additional details see the American Association of State Highway and Transportation Officials (AASHTO) Uniform Audit & Accounting Guide (2012 Edition).

At SCDOT the fixed fee amount is then calculated typically at 10% of direct labor cost plus the indirect cost (overhead amount). Direct expenses and sub-consultant costs are then added in to determine the total contract amount.

In almost all cases the method of payment in such contracts has been "Cost Plus Fixed Fee" (CPFF). Under the Cost Plus Fixed Fee method of payment the consultant is reimbursed for all eligible direct and indirect costs plus a negotiated Fixed Fee (Operating Margin) expressed as a dollar amount that is fixed at the inception of the contract. Once the contract is executed this Fixed Fee amount does not vary with actual costs, but it may be adjusted by contract modification as a result of scope changes in the work to be performed under the contract. Even in the contracts that utilize a payment method other than Cost Plus Fixed Fee, the operating margin or "profit" is typically calculated as a percentage of anticipated project labor and indirect (overhead) costs during contract negotiations. Methods of payment other than Cost Plus Fixed Fee include: Lump Sum; Cost per Unit of Work; and Specific Rates of Compensation.

CALCULATION OF FIXED FEE:

FHWA guidance provides some degree of negotiating flexibility in determining the Fixed Fee amount of a Cost Plus Fixed Fee (CPFF) contract. According to FHWA guidelines: "The establishment of the fixed fee should be project specific and shall consider scope, complexity, and professional nature of the services to be rendered [as specified in the 40 U.S.C. 1104(a)]. Other considerations may include the size and type of contract as well as the duration and degree of risk involved in the work. Fixed fees in excess of fifteen (15) percent of the total direct and indirect costs of the contract may be justified only when exceptional circumstances exist".

In this paper Fixed Fee (sometimes referred to as Fixed Net Fee or Net Fee) is a dollar amount established for Operating Margin.

As mentioned previously, the South Carolina Department of Transportation (SCDOT) typically calculates fixed fee as a percentage of Direct Labor plus Overhead costs. In most cases 10% is used as a "Fair and Reasonable" fixed fee for preconstruction contracts involving engineering design and related services though in certain cases a different percentage has been applied given the magnitude, complexity and/or risks associated with the project. This method of calculating fixed fee as a percentage of direct labor and the firm's audited overhead rate may not provide an appropriate incentive for a consulting firm to effectively manage its overhead costs. In fact, it could be argued that it provides a disincentive to engineering consulting firms to effectively managing their overhead costs. For example, if firm "A" is selected to provide professional services for a given project and the total direct labor cost is negotiated to be $1,000,000 and the consulting firm's approved audited overhead rate is say 165.00% of direct labor costs, the fixed fee would be calculated to be $265,000 as shown in Exhibit 2:

Exhibit 2: Firm "A" Fixed Fee Calculation		
a.	Total Direct Labor	$1,000,000.00
b.	Overhead (165% of Direct Labor)	$1,650,000.00
c.	Direct Labor + Overhead (a+b)	$2,650,000.00
d.	Fixed Fee at 10% (c x 10%)	$265,000.00

Let's assume this calculated fixed fee of $265,000 is for firm "A" to provide engineering design services for a bridge replacement project. In addition, let's assume that during negotiations firm "A" is estimated to have $50,000 of direct expenses on this project. The total contract amount would be calculated to be $2,965,000.00 as shown below in Exhibit 3:

Exhibit 3: Firm "A" Total Contract Amount		
a.	Total Direct Labor	$1,000,000.00
b.	Overhead (165%)	$1,650,000.00
c.	Direct Labor + Overhead (a+b)	$2,650,000.00
d.	Fixed Fee at 10% (c*10%)	$265,000.00
e.	Direct Expenses	$50,000
f.	Total Contract Amount (c+d+e)	$2,965,000.00

Now let's assume firm "B" is selected to provide engineering services for another very similar bridge replacement project which also is negotiated to have direct labor costs totaling $1,000,000. However, firm "B" has an approved audited overhead rate of 175.00%. The fixed fee amount for this project would be calculated to be $275,000 as shown in Exhibit 4:

Exhibit 4: Firm "B" Fixed Fee Calculation		
a.	Total Direct Labor	$1,000,000.00
b.	Overhead (175%)	$1,750,000.00
c.	Direct Labor + Overhead (a+b)	$2,750,000.00
d.	Fixed Fee at 10% (c*10%)	$275,000.00

If firm "B" also has $50,000 in direct expenses for the project the total contract amount would be $3,075,000.00 as follows in Exhibit 5:

Exhibit 5: Firm "B" Total Contract Amount		
a.	Total Direct Labor	$1,000,000.00
b.	Overhead (175%)	$1,750,000.00
c.	Direct Labor + Overhead	$2,750,000.00
d.	Fixed Fee at 10%	$275,000.00
e.	Direct Expenses	$50,000
f.	Total Contract Amount	$3,075,000.00

Notice that the fixed fee for firm "B" in the amount of $275,000 is $10,000 higher than the fixed fee for firm "A" of $ 265,00 by virtue of the fact that firm "B" has an approved audited overhead rate 10 percentage points higher than firm "A". In addition, the fact that firm "B", by virtue of its approved overhead rate of 175%, is entitled to $1,750,000 in overhead costs compared to firm "A", which is entitled to $1,650,000 in overhead costs, results in the difference in the total contract amount between firm "A" and firm "B" of $110,000 ($3,075,000-$2,965,000). Given this difference, is it legitimate to ask, is each fixed fee "Fair and Reasonable" and/or "Fair and Reasonable" to whom? Are they fair to each of the consultant firms? Are they fair to SCDOT? Are they fair to the taxpayers of South Carolina or to those motorists who pay the "federal and state gas taxes" funding South Carolina roadways?

A somewhat different approach to calculating fixed fee has been used recently by SCDOT for Construction Engineering and Inspection (CE&I) contracts. In negotiating Construction Engineering and Inspection contracts the fixed fee has been calculated based on an applied field office overhead rate of 123% and an office overhead rate of 164%. In this case a firm is still reimbursed for its actual direct labor costs as well as its field office overhead cost and its office overhead cost as appropriate, but the fixed fee calculation is based on an" industry average" overhead rate (for both field and office overhead rates). For example, let's assume firm "C" is selected to provide Construction Engineering and Inspection (CE&I) services for a roadway widening project and let's assume negotiations determine that this CE&I contract requires $2,000,000 of direct field labor plus $500,000 of direct office labor and that it is negotiated that a fixed fee of 8% will be based on the industry average of 123% overhead for field labor and 164% overhead for office labor. In addition, let's assume firm "C" has an actual approved audited field overhead rate of 125% (rather than the industry average of 123% and an approved audited office overhead rate of 165% (rather than the industry average of 164%). In this case the fixed fee would be calculated as shown in Exhibit 6 as follows:

Exhibit 6: Firm "C" Fixed Fee Calculation		
a.	Total Direct Field Office Labor	$2,000,000.00
b.	Field Overhead (125%) (a*125%)	$2,500,000.00
c.	Direct Field Labor +Field Overhead (a+b)	$4,500,000.00
d.	Direct Field Labor +Field Overhead at 123% (a+(a*123%)	$4,460,000.00
e.	Fixed Fee of 8% on Direct Field Labor at 123% (d*8%)	$356,800.00
f.	Total Direct Office Labor	$500,000.00
g.	Office Overhead at 165% (f*165%)	$825,000.00
h.	Office Labor + Office Overhead (f+g)	$1,325,000.00
i.	Office Labor + Office Overhead at 164% (f+(f*164%)	$1,320,000.00
j.	Office Fixed Fee of 8% on Total Direct Office Labor at 164% (i.*8%)	$105,600.00
k	Total Fixed Fee: Field Fixed Fee (e) plus Office Fixed Fee (j)	$462,400.00

Note that in this case firm "C" would be paid for its direct field labor and approved field overhead plus the calculated field fixed fee of $356,800 plus its office direct labor and approved office overhead plus the calculated fixed fee on office labor of $105,600 for a total fixed fee of $462,400.00. Note also that this fixed fee amount is less than if the fixed fee had been calculated using firm "C" actual field and office overhead rates.

Now let's assume firm "D" also is selected to provide Construction Engineering and Inspection (CE&I) services for another roadway widening project very similar in all respects to the project to be performed by firm "C" but firm "D" has an approved field overhead rate of 118% and an approved office overhead rate of 160%. For consistency with the example above let's assume the direct field labor for firm "D" is also $2,000,000 and that its direct office labor is $500,000. In this case the fixed fee would be calculated as follows in Exhibit 7:

Exhibit 7: Firm "D" Fixed Fee Calculation		
a.	Total Direct Field Office Labor	$2,000,000.00
b.	Field Overhead (118%) (a*118%)	$2,360,000.00
c.	Direct Field Labor +Field Overhead (a+b)	$4,360,000.00
d.	Direct Field Labor +Field Overhead at 123% (a+(a*123%)	$4,460,000.00
e.	Fixed Fee of 8% on Direct Field Labor at 123% (d*8%)	$356,800.00
f.	Total Direct Office Labor	$500,000.00
g.	Office Overhead at 160% (f*160%)	$800,000.00
h.	Office Labor + Office Overhead (f+g)	$1,300,000.00
i.	Office Labor + Office Overhead at 164% (f+(f*164%)	$1,320,000.00
j.	Office Fixed Fee of 8% on Total Direct Office Labor at 164% (i.*8%)	$105,600.00
k	Total Fixed Fee: Field Fixed Fee (e) plus Office Fixed Fee (j)	$462,400.00

Note that in this case the total calculated fixed fee for firm "D" is the same amount ($462,400) as the calculated fixed fee for firm "C" in the example above in Exhibit 6 even though firms "C" and "D" have somewhat different approved audited field overhead and office overhead rates.

The interesting point here is that because firm "D" has an actual audited field overhead rate of 118% and an actual audited office overhead 160%, both of which are somewhat below the industry average rates used in the fixed fee calculation, their actual fixed fee amount is somewhat above the 8% used in the fixed fee calculation. In effect, they are rewarded for their lower overhead rate. In other words, this approach provides an incentive for firms to manage their overhead more effectively. Meanwhile firm "C" which has a somewhat higher approved audited field overhead rate of 125% and a somewhat higher audited office overhead rate of 165% than the industry average rates used in the fixed fee calculation, their actual fixed fee is somewhat below the 8%. In effect, firm "C" experiences somewhat of a lower profit margin than firm "D". This fixed fee calculation method may motivate firms to manage their overhead costs more rigorously to achieve an audited overhead rate at or below the industry average. This method is somewhat similar to the method Tennessee DOT uses in its Net Fee Calculation. At TDOT the net fee is calculated as follows: Net Fee = 2.35 X Direct Salary X Allowed Net Fee Rate. (TDOT Policy Number: 301-01 page 14).

Another method of calculating fixed fee is a method used by the Florida Department of Transportation (FDOT). FDOT calculates Fixed Fee (which they refer to as Operating Margin) as a percentage of total direct labor only. This is a different approach than SCDOT (and other state

DOTs) utilizes which calculates Fixed Fee generally as a percentage of direct labor costs and either an approved audited overhead rate or an applied overhead rate as discussed above. Once the total direct labor cost amount is negotiated based upon the estimated staff-hours required by staff classification needed to perform a scope of work, FDOT determines the appropriate fixed fee percentage to be applied within a range of 12 to 42 percent based on an evaluation matrix that takes the complexity of the project, the degree of financial risk assumed by the Consultant, the project schedule, and Consultant cost control efforts in to account (See Exhibit 8 below).

Exhibit 8: Operating Margin Percentage Calculation for Direct Salaries	
Criteria	Range of Percentage
Project Complexity	5% to 7%
Degree of Risk (Financial)	3% to 5%
Project Schedule	1% to 3%
Cost Control Efforts	3% to 27%
TOTAL	12% to 42%

The resulting dollar amount is the “fixed fee” (operating margin) portion of a cost plus fixed fee type contract or it becomes part of the total fixed price in a lump sum agreement. This method of negotiating the operating margin as a fixed fee provides an incentive for the consulting firm to efficiently complete the contract requirements. Completing the contract with less than estimated costs (excluding the fixed fee) benefits both the Department (lower overall contract cost) and the Consultant. Yet the question with respect to this method is does it provide an adequate incentive to firms to manage their overhead costs more effectively. As the firm’s overhead is not included in the fixed fee calculation under this method the answer would be no (or, at least, not really). The firm is paid its overhead amount aside from the fixed fee calculation.

Negotiators at Florida DOT are provided guidelines by which to determine the appropriate operating margin for each individual contract. As explained in the FDOT Negotiation Handbook, and as shown in Exhibit 8 above, there is a large variation in operating margins within the range to account for the wide spectrum of cost control by various Consultants that conduct business with FDOT. As a result there can be significant variation in operating margin from contract to contract and negotiators are instructed not to use a standard operating margin for all contracts as each contract is unique.

In certain cases it is possible for negotiators to negotiate operating margins outside of the range for special circumstances on a contract. For example, if overhead rates, direct expense rates or salaries are significantly above (or below) the normal range, operating margins below (or above) the ranges may be negotiated. In such cases, there may be more of an incentive to a firm to manage its overhead as close to the industry average as possible. Other factors that impact the cost/benefit to the Department and/or Consultant may also be considered. However, in all cases the fee proposal must include a justification for the proposed operating margin.

Now let's apply FDOT's method to a hypothetical example.

Let's assume a firm is selected to provide engineering design services for a roadway improvement project and that as a result of negotiations it is determined the total direct labor for the project is $1,000,000 and that direct expenses for the project total $35,000. Let's also assume that the firm has an approved overhead rate of 165%. In evaluating the criteria of project complexity, the degree of risk, the project schedule and cost control efforts for determining an operating margin, let's assume negotiations result in a percentage of 27% as shown on Exhibit 9:

Exhibit 9: Operating Margin Percentage Calculation for Direct Salaries		
Criteria	Range of Percentage	Actual Percentage
Project	5% to 7%	6%
Degree of Risk	3% to 5%	4%
Project Schedule	1% to 3%	2%
Cost Control	3% to 27%	15%
TOTAL	12% to 42%	27%

Using this 27% for the fixed fee calculation would result in a total contract amount of $2,955,000.00 as shown in Exhibit 10 as follows:

Exhibit 10: Fixed Fee at 27% of Direct Labor		
a.	Direct Labor	$1,000,000.00
b.	Overhead at 165%	$1,650,000.00
c.	Direct Labor + Overhead	$2,650,000.00
d	Fixed Fee (a*27%)	$270,000.00
e.	Direct Expenses	$35,000.00
f.	Total Contract Amount (c+d+e)	$2,955,000.00

For comparison purposes, if the fixed fee had been calculated at 10% of direct labor plus overhead the fixed fee would be $265,000 and the total contract amount would be $2,950,000 as shown in Exhibit 11.

Exhibit 11: Fixed Fee at 10% of Direct Labor + Overhead		
a.	Direct Labor	$1,000,000.00
b.	Overhead at 165%	$1,650,000.00
c.	Direct Labor + Overhead	$2,650,000.00
d	Fixed Fee (c*10%)	$265,000.00
e.	Direct Expenses	$35,000.00
f.	Total Contract Amount (c+d+e)	$2,950,000.00

As a result, we see that the fixed fee of $270,000 when calculated using 27% of direct labor is slightly more than the fixed fee of $265,000 when calculated using 10% of direct labor plus overhead. Conversely, if negotiations had resulted in determining that the appropriate percentage to apply to direct labor was say 22%, the fixed fee would have been $220,000 and the total contract amount would have been $2,905,000.00 as shown in Exhibit 12.

Exhibit 12: Fixed Fee at 22% of Direct Labor		
a.	Direct Labor	$1,000,000.00
b.	Overhead at 165%	$1,650,000.00
c.	Direct Labor + Overhead	$2,650,000.00
d	Fixed Fee (a*22%)	$220,000.00
e.	Direct Expenses	$35,000.00
f.	Total Contract Amount (c+d+e)	$2,905,000.00

A REVIEW OF SCDOT CONTRACTS

Now let's examine some actual contracts that the SCDOT has executed during the period July 1, 2012 through June 30, 2015 (FY 2012, 2013 and 2014). Exhibit 13 lists 16 Preconstruction Professional Service contracts executed over the past 3 fiscal years where the contract amount is greater than $1 million. The exhibit shows the direct labor cost, the approved audited overhead rate applied to direct labor for the contract, the resulting overhead amount, the fixed fee percentage applied to the sum of direct labor and overhead amounts, and the resulting fixed fee amount for each contract listed. As noted in the exhibit the overhead rates range from a low of 144.51% (contract # 1709) to a high of 193.50% (contract #1711).

Exhibit 13: Selected Professional Service Contracts (FY 2012, 2013 & 2014) with Total Contract Amount over $1,000,000											
Contract Number	Contract Execution Date	Executed Contract Amount	Direct Labor Cost	Overhead Rate	Overhead Amount	Fixed Fee (percentage)	Fixed Fee Amount	FCCM Amount	Direct Expenses	Subconsultant Costs	Total Contract Amount
1683	12/5/2014	$6,002,390.18	$574,621.14	164.04%	$942,608.52	10%	$151,722.97	$1,264.15	$108,883.94	$4,223,289.44	$6,002,390.15
1690	1/21/2015	$4,109,720.16	$578,572.10	157.93%	$913,738.90	12%	$179,077.32	$867.85	$102,314.40	$2,335,149.59	$4,109,720.16
1632	1/7/2014	$3,351,351.71	$773,702.56	152.91%	$1,183,068.61	10%	$195,677.13	$4,100.60	$586,835.43	$607,967.38	$3,351,351.71
1709	3/25/2015	$2,872,772.52	$552,198.98	144.51%	$797,982.75	10%	$135,018.20	$938.73	$12,463.90	$1,374,169.95	$2,872,772.51
1726	5/21/2015	$2,834,641.57	$516,999.21	165.00%	$853,048.66	10%	$137,004.82	$0.00	$60,188.28	$1,267,400.60	$2,834,641.57
1716	4/29/2015	$2,810,637.48	$258,500.19	157.93%	$408,249.35	10%	$66,674.98	$387.73	$18,413.76	$2,058,411.48	$2,810,637.49
1612	6/25/2013	$2,737,173.98	$151,799.50	158.05%	$239,919.12	10%	$39,171.86	$880.43	$11,235.00	$1,017,902.59	$1,460,908.50
1583	1/29/2013	$2,610,578.57	$208,326.59	152.91%	$318,552.19	10%	$52,687.93	$1,104.14	$42,667.25	$873,052.44	$1,496,390.54
1710	3/25/2015	$2,192,438.58	$426,365.18	185.82%	$792,271.78	10%	$121,863.73	$1,065.90	$18,803.00	$832,068.99	$2,192,438.58
1711	3/25/2015	$1,981,730.79	$178,063.42	193.50%	$344,552.69	10%	$52,261.61	$1,175.22	$2,574.60	$600,372.09	$1,178,999.63
1563	9/25/2012	$1,739,474.93	$545,746.06	152.91%	$834,500.30	10%	$138,024.63	$2,892.44	$218,311.50	$0.00	$1,739,474.93
1616	7/22/2013	$1,276,231.06	$138,778.82	167.12%	$231,927.20	10%	$37,070.60	$0.00	$5,198.00	$863,256.44	$1,276,231.06
1654	7/8/2014	$1,104,849.01	$167,981.76	157.88%	$265,209.60	10%	$43,319.14	$319.17	$20,773.00	$607,246.34	$1,104,849.01
1622	9/24/2013	$1,089,010.97	$239,763.70	160.31%	$384,365.17	10%	$62,412.92	$1,102.94	$83,026.28	$318,339.96	$1,089,010.97
1708	3/23/2015	$1,049,994.93	$263,019.02	165.76%	$435,980.36	10%	$69,899.97	$631.24	$33,217.88	$247,246.46	$1,049,994.93
1569	10/29/2012	$1,041,053.69	$129,856.32	170.07%	$220,846.62	10%	$35,070.29	$1,080.41	$10,501.90	$643,698.15	$1,041,053.69

Scenario #1: Calculating Fixed Fee Based on a Percentage of Direct Labor plus the Selected firm's Audited Overhead Amount

In the case of contract # 1711 the negotiated direct labor cost of $178,063.42, plus the overhead amount of $344,552.69 (calculated at 193.50% of direct labor), results in a total of direct labor plus overhead cost of $522,616.11. The fixed fee, calculated at 10% of direct labor plus the overhead amount results in a fixed fee amount of $52,261.61 as shown in Exhibit 14.

Exhibit 14: Contract #1711	
a. Direct Labor	$178,063.42
b. Overhead at 193.50%	$344,552.69
c. Direct Labor + Overhead (a+b)	$522,616.11
d. Fixed Fee (c*10%)	$52,261.61
e. FCCM	$1,175.22
f. Direct Expenses	$2,574.60
g.Subconsultant Cost	$600,372.09
h. Total Contract Amount	$1,178,999.63

In the event that a different consulting engineering firm with a lower audited overhead rate had been selected for this project, for example the firm with an overhead rate of 144.51% as on contract # 1709, and the negotiated direct labor amount remained $178,063.42, the overhead amount would have been reduced from $344,552.69 to $257, 319.45 (a difference of $87,233.24) and the fixed fee would have been reduced from $52,261.61 to $43,438.29 (a difference of $8,723.32) as shown below on Exhibit 15. Assuming the FCCM amount, Direct Expenses and Subconsultant costs all remained the same, the total contract amount would have been $1,083,043.07 rather than $1,178,999.63 (a difference of $95,956.56) which illustrates the impact of the overhead rate to both the fixed fee amount as well as the total contract amount.

Exhibit 15: Contract #1711 applying a different Overhead Rate	
a. Direct Labor	$178,063.42
b. Overhead at 144.51%	$257,319.45
c. Direct Labor + Overhead (a+b)	$435,382.87
d. Fixed Fee (c*10%)	$43,538.29
e. FCCM	$1,175.22
f. Direct Expenses	$2,574.60
g. Subconsultant Cost	$600,372.09
h. Total Contract Amount	$1,083,043.07

Scenario #2: Calculating Fixed Fee Based on a Percentage of Direct Labor plus an Applied "Industry Average" Overhead Rate.

Now let's consider an alternate method of calculating fixed fee. In this scenario let's assume an "industry average" overhead rate is applied in calculating the fixed fee. Exhibit 16 assumes the selected firm's direct labor cost and approved overhead rate is applied as in Exhibit 15 but, in the calculation of the fixed fee, an industry average overhead rate of 160.00% is applied rather than the selected firm's actual approved overhead rate. Using this method the fixed fee is calculated at $46,296.49 as opposed to $52,261.61 when the selected firm's actual overhead amount is used to calculate the fixed fee rather than the "industry average" of $160.00%. Note this also results in a total contract amount of $1,173,034.51 rather than $ 1,178,999.63.

Exhibit 16: Contract #1711 applying an "Industry Average "Overhead of 160.00% in the Fixed Fee Calculation of a firm with an approved overhead rate of 193.50%.	
a. Direct Labor	$178,063.42
b. Overhead at 193.50%	$344,552.69
c. Direct Labor + Overhead (a+b)	$522,616.11
d. Direct Labor * 160.00% ("Industry Average")	$284,901.47
e. Direct Labor + Direct Labor*160% (a+d)	$462,964.89
f. Fixed Fee (e*10%)	$46,296.49
g. FCCM	$1,175.22
h. Direct Expenses	$2,574.60
i.Subconsultant Cost	$600,372.09
j. Total Contract Amount (c+f+g+h+i)	$1,173,034.51

In the event that the firm with the 144.51% approved overhead rate had been selected, and all other costs remained the same, the total contract amount would have been $1,085,801.27 as shown in Exhibit 17.

Exhibit 17: Contract #1711 applying an "Industry Average" Overhead of 160.00% in the Fixed Fee Calculation for a firm with a 144.51% approved overhead rate.	
a. Direct Labor	$178,063.42
b. Overhead at 144.51%	$257,319.45
c. Direct Labor + Overhead (a+b)	$435,382.87
d. Direct Labor * 160.00%	$284,901.47
e. Direct Labor + Direct Labor*160% (a+d)	$462,964.89
f. Fixed Fee (e*10%)	$46,296.49
g. FCCM	$1,175.22
h. Direct Expenses	$2,574.60
i.Subconsultant Cost	$600,372.09
j. Total Contract Amount (c+f+g+h+i)	$1,085,801.27

As can be seen by the results of Exhibit 16 and 17, applying an "Industry Average" overhead rate in the fixed fee calculation results in firms with different approved overhead rates receiving the same fixed fee amount when an "Industry Average" overhead rate is applied in the fixed fee calculation. Moreover, the firm with the lower overhead rate of 144.51% actually would receive a somewhat higher fixed fee amount than it would have received as illustrated in Scenario #1, while the firm with the approved overhead rate of 193.50% would receive a fixed fee amount somewhat lower than in Scenario #1. Yet each firm would be receiving the same fixed fee amount. Is this method as illustrated in Scenario #2 "Fair and Reasonable" to each firm as well as the SCDOT?

Scenario #3: Calculating Fixed Fee by Applying a Criteria based Percentage to Direct Labor

A third method of calculating fixed fee is to base the fixed fee percentage on direct labor costs only while developing the percentage based on a variety of negotiated criteria. This is a method employed by the Florida Department of Transportation (FDOT). As discussed on page 7 and shown on Exhibit 8, Florida DOT considers criteria such as Project Complexity, Degree of Risk, Project Schedule and Cost Control Efforts to negotiate fixed fee.

Using the example of Contract # 1711 as we have above, let's assume negotiations result in an agreement with respect to percentages to apply in calculating the fixed fee as shown below on Exhibit 18. Keep in mind that negotiations for each individual project consider such criteria and the actual agreed to percentages will vary by project.

Exhibit 18: Criteria for Calculating Fixed Fee per Florida Department of Transportation		
Criteria	Range of Percentage	Agreed Percentage
Project Complexity	5% to 7%	6%
Degree of Risk (Financial)	3% to 5%	4%
Project Schedule	1% to 3%	2%
Cost Control Efforts	3% to 27%	15%
TOTAL	12% to 42%	27%

Applying the 27% to the Direct Labor amount only to determine the Fixed Fee would result in a fixed fee amount of $48,077.12 as shown in Exhibit 19. Note, the firm is paid for its direct labor costs and its audited overhead amount (based on 193.50%) resulting in a total contract amount of $1,174,815.14.

Exhibit 19: Contract #1711 applying a Fixed Fee of 27% to Direct Labor	
a. Direct Labor	$178,063.42
b. Overhead at 193.50%	$344,552.69
c. Direct Labor + Overhead (a+b)	$522,616.11
d. Fixed Fee (a x 27%)	$48,077.12
e. FCCM	$1,175.22
f. Direct Expenses	$2,574.60
g. Subconsultant Cost	$600,372.09
h. Total Contract Amount	$1,174,815.14

Moreover, under this scenario, the firm with a 144.51% audited overhead rate would also receive a fixed fee of $48,077.12 as shown in Exhibit 20 although the total contract amount would be $1,087,581.90. Again, one could ask, is this "Fair and Reasonable"?

Exhibit 20: Contract #1711 applying a Fixed Fee of 27% to Direct Labor	
a. Direct Labor	$178,063.42
b. Overhead at 144.51%	$257,319.45
c. Direct Labor + Overhead (a+b)	$435,382.87
d. Fixed Fee (a *27%)	$48,077.12
e. FCCM	$1,175.22
f. Direct Expenses	$2,574.60
g.Subconsultant Cost	$600,372.09
h. Total Contract Amount	$1,087,581.90

EVALUATION AND RECOMMENDATION

As noted above there are various methods for calculating the fixed fee of a Cost Plus Fixed Fee contract. For this paper the assumption is that the objective in selecting an appropriate method for calculating fixed fee should be achieving the "Fair and Reasonable" standard while providing an incentive to consulting firms to effectively manage their respective overhead costs and not necessarily the method that results in the lowest price. It also is important that whatever method is selected that it be consistently applied for all professional service contracts for all firms. Selecting the method to be used should require consideration of what is "Fair and Reasonable" to all parties: the SCDOT, the taxpayers or users of the transportation system, and the various private sector engineering consulting firm providing services to SCDOT.

As demonstrated in this paper the current method of applying 10% to the estimated direct labor costs plus the firm's approved audited overhead on engineering services for preconstruction projects results in a higher fixed fee dollar amount the higher the approved audited overhead rate is. Consequently, this method does not provide an incentive to engineering firms to effectively manage their overhead costs, in fact, it provides a disincentive by rewarding the firms with approved overhead rates above the industry average. As a consequence it does not result in the most "Fair and Reasonable" standard to firms that manage their overhead cost more effectively than others or to SCDOT.

It could be argued that the method of applying a percentage to direct labor only in determining a fixed fee amount, perhaps, appears to be the most straight forward and "fairest" method as it takes the firm's overhead rate out of the calculation of the fixed fee amount. However, the question could be asked does this method actually provide an appropriate incentive for a firm to take measures to better manage their overhead (indirect) costs. They would still receive their full overhead amount resulting in a total contract amount somewhat higher than a firm with a lower overhead even though the fixed fee of each firm would be the same.

The method of applying an "industry average" overhead rate in the calculation of fixed fee appears to provide a better incentive to firms to more effectively manage their overhead costs benchmarked to the industry average. It is recommended that this method be adopted.

In selecting a preferred method of calculating the fixed fee amount in professional service contracts senior management at SCDOT should reach agreement on a method taking into consideration the importance of providing an incentive to consulting firms to effectively manage their overhead costs.

IMPLEMENTATION

Once senior management reaches an agreement on the method to be used, it will be necessary to update the SCDOT negotiating policies and procedures accordingly so that the agreed upon method is consistently applied in future negotiations. Before an effective date is established for the implementation of applying the new method, a briefing/training session of the method selected should be provided to all SCDOT Program Managers, Assistant Program Managers, Contract Negotiators and others who may be involved with professional service contracting so that the method is implemented consistently from the effective date forward. This training could be provided in person or on-line. In addition, prior to establishing an effective date for implementation of the selected method, the SCDOT also should offer to provide a briefing to key stakeholders including the ACEC-SC (The American Council of Engineering Companies of South Carolina) which is the professional association that represents consulting engineering firms in South Carolina. While some firms may welcome the change, others may express concerns. Again, it is recommended that the basis for any change is to apply a method that better achieves the "Fair and Reasonable" standard while providing an incentive to consulting firms to effectively manage their overhead costs.

Once the preferred method is decided upon, it will be necessary to incorporate it into the appropriate Department Directive and the SCDOT Manual for Procurement and Administration of Architectural & Engineering Services which services as the policy and procedural manual for Department Directive 41. Once incorporated it should be posted on the SCDOT professional services webpage for internal use as well as for use by engineering consulting firms doing business with SCDOT. Once implemented, it will also be necessary to incorporate the appropriate formula for calculating the fixed fee into the standard estimating templates used in negotiating professional service contract.

APPENDIX A: DEFINITIONS

Audit: A formal examination, in accordance with professional standards, of a consultant's accounting systems, incurred cost records, and other cost presentations to test the reasonableness, allowability, and allocability of costs in accordance with the Federal cost principles (as specified in 48 CFR part 31).

The Brooks Act (40 U.S.C. 1101 et seq.): The primary authority for the procurement, management, and administration of engineering and design related services directly related to a highway construction project and reimbursed with FAHP funding is codified in 23 U.S.C. 112(b)(2). States and local public agencies are required to procure engineering and design related services in accordance with the qualifications based selection procedures prescribed in the Brooks Act (40 U.S.C. 1101 et seq.) and to accept and apply consultant indirect cost rates established by a cognizant Federal or State agency in accordance with the Federal Acquisition Regulation (FAR) cost principles (48 CFR part 31).

Cognizant agency: Any governmental agency that has performed an audit in accordance with generally accepted government auditing standards to test compliance with the requirements of the Federal cost principles (as specified in 48 CFR part 31) and issued an audit report of the consultant's indirect cost rate, or any described agency that has conducted a review of an audit report and related work papers prepared by a certified public accountant and issued a letter of concurrence with the audited indirect cost rate(s). A cognizant agency may be any of the following:

(1) A Federal agency;

(2) A State transportation agency of the State where the consultant's accounting and financial records are located; or

(3) A State transportation agency to which cognizance for the particular indirect cost rate(s) of a consulting firm has been delegated or transferred in writing by the State transportation agency identified in paragraph (2) of this definition.

Competitive negotiation means qualifications-based selection procurement procedures complying with 40 U.S.C. 1101–1104, commonly referred to as the Brooks Act.

Contract : a written procurement contract or agreement between a contracting agency and consultant reimbursed under a FAHP grant or subgrant and includes any procurement subcontract under a contract.

Contract modification: an agreement modifying the terms or conditions of an original or existing contract.

Contract types. The types of contracts which shall be used are:

(1) **Project-specific**. A contract between the contracting agency and consultant for the performance of services and defined scope of work related to a specific project or projects.

(2) **Multiphase.** A project-specific contract where the defined scope of work is divided into phases which may be negotiated and authorized individually as the project progresses.

(3**) On-call or indefinite delivery/indefinite quantity (IDIQ**). A contract for the performance of services for a number of projects, under task or work orders issued on an as-needed or on-call basis, for an established contract period. The procurement of services to be performed under on-call or IDIQ contracts must follow either competitive negotiation or small purchase procurement procedures (as specified in § 172.7).

Cost Plus Fixed Fee – A method of compensation based on the actual allowable and documented cost of labor, overhead, and other non-salary direct cost incurred by the firm performing the work plus a negotiated Fixed Fee. The Fixed Fee does not vary with actual cost, but may be adjusted by contract modification should changes in the scope of work to be performed change during the course of the contract. As a result, cost plus fixed fee contracts are appropriate when the" extent, scope, complexity, character or duration of the project" cannot reasonably be defined at the time of negotiation. Under such an agreement the contract includes a maximum amount payable under the agreement. This type of agreement typically includes an attachment with a complete breakdown of estimated costs by major element of work or task/subtasks.

Cost per Unit of Work Payment Method: A method of payment based on an agreed cost per unit of work which may include labor, overhead, fixed fee and other non-salary costs. The fee is calculated per project assignment and is fixed. This type of contract (sometimes referred to as a unit rate contract) is appropriate when the cost per unit can be determined with reasonable accuracy, but the extent of work is indefinite. This method of payment is normally used for repetitive tasks and is suitable where the magnitude of service is uncertain but the character of the service and the cost per unit can be determined accurately. Rates are negotiated for specified tasks and the negotiated rates are in place for the life of the contract and may include escalation factors for multi-year agreements. These agreements clearly specify what is included in each rate. For example, if the consultant is allowed to charge travel expenses in addition to the negotiated rate, that fact should be included in the contract. This type of contract may include specific fixed hourly rates or daily rates for each employee classification directly engaged in the work. The agreed upon rates include the consultant's estimated costs, overhead and net fee, sometimes referred to as fully loaded rates.

Engineering and design related services means: (1) Program management, construction management, feasibility studies, preliminary engineering, design engineering, surveying, mapping, or architectural related services with respect to a highway construction project subject to 23 U.S.C. 112(a) (as defined in 23 U.S.C. 112(b)(2)(A)); and (2) Professional services of an architectural or engineering nature, as defined by State law, which are required to or may logically or justifiably be performed or approved by a person licensed, registered, or certified to provide the services (as defined in 40 U.S.C. 1102(2)).

Federal Acquisition Regulation, Part 31 (FAR): The FAR is the primary regulation governing the acquisition of supplies and services with Federal funds. The FAR is codified at 48 CFR Part 31 which sets the criteria for determining costs eligible for reimbursement on Federally-funded agreements and may be used to determine allowable costs for contracts funded solely by State funds.

FAR-Compliant Audit: Refers to a formal audit or examination of the indirect cost rate schedule and associated notes, to obtain reasonable assurance that the costs presented in the schedule substantially comply with the Cost Principles of FAR Subpart 31.2. When performing FAR-compliant audits, auditors must apply the standards applicable to financial audits or examination level attestation engagements as contained in the Government Auditing Standards issued by the Comptroller General of the United States.

Federal cost principles: the cost principles contained in 48 CFR part 31 of the Federal Acquisition Regulations for determination of allowable costs of commercial, for-profit entities (as specified in 49 CFR 18.22(b)).

Fixed Fee – A dollar amount established to cover the consultant's operating margin or a dollar amount established to cover the consultant's profit and business expenses not allowable or otherwise included as a direct of indirect cost. The establishment of a fixed fee shall be project specific and shall take into account the size, complexity, duration and degree of risk involved in the work.

Generally Accepted Accounting Principles (GAAP): GAAP has the meaning specified in accounting standards issued by the Government Accounting Standards Board (GASB) and the Financial Accounting Standards Board (FASB).

Generally Accepted Government Auditing Standards (GAGAS): GAGAS, also known as the Yellow Book, means generally accepted government auditing standards issued by the Comptroller General of the United States, which are applicable to financial audits.

Indirect cost rate proposal: Indirect cost rate proposal means the documentation prepared by a non-Federal entity to substantiate its request for the establishment of an indirect cost rate as described in Appendix III to Part 200.

Lump Sum (Fixed Price) Agreement: An agreement in which the method of payment for delivered goods and/or services is a fixed amount that includes salaries, overhead, and operating margin. Once the lump-sum amount is determined, the goods and/or services must be provided regardless of the engineering consultant's actual costs. No adjustments are permitted to compensate the engineering consultant for costs in excess of the contract's fixed amount unless there is a significant change in the scope of work that results in an approved change order. This method of payment is appropriate only if "the extent, scope, complexity, character and duration of the work required can be established to a high degree of certainty that just compensation can be determined and evaluated by all parties at the time of negotiations".

Multiphase Contract: A project-specific contract where the defined scope of work is divided into phases which may be negotiated and authorized individually as the project progresses.

Non Salary Direct Costs – Charges, except for labor, which are customarily job or project related including, but not limited to, travel, document reproduction, telephone, etc.

Overhead – A firm's indirect cost, stated as a percentage of direct labor, including general administrative expenses plus employee fringe benefits. Fringe benefits may include employer's portion of F.I.C.A., comprehensive health insurance, group life insurance, unemployment contributions to the state, vacation, sick leave, holidays, workers compensation and other such benefits.

Overhead rate or indirect cost rate: Refers to a factor/ratio computed by adding together all of a firm's costs that cannot be associated with a single cost objective (e.g., general and administrative costs and fringe benefit costs), then dividing by a base value (usually direct labor cost) to determine a rate. This rate is applied to direct labor, as incurred on projects, to allow a firm to recover the appropriate share of indirect costs allowable per the terms of specific agreements. In this paper, the terms "indirect cost rate" and "overhead rate" are used synonymously.

Payment methods. The method of payment to the consultant shall be set forth in the original solicitation, contract, and in any contract modification thereto. The methods of payment shall be: (1) Lump sum, (2)cost plus fixed fee, (3) cost per unit of work, or (4)specific rates of compensation. A single contract may contain different payment methods as appropriate for compensation of different elements of work.

Performance goal: Performance goal means a target level of performance expressed as a tangible, measurable objective, against which actual achievement can be compared, including a goal expressed as a quantitative standard, value, or rate. In some instances (e.g., discretionary research awards), this may be limited to the requirement to submit technical performance reports (to be evaluated in accordance with agency policy).

Reasonable Cost: A cost is reasonable, if, in its nature and amount, it does not exceed that which would be incurred by a prudent person in the conduct of competitive business. See Section 4.2 for additional discussion.

SCDOT Office of Contract Assurance (OCA) –The office responsible for assisting SCDOT management by performing independent reviews of consultants, municipalities, railroads, utilities, and other third party recipients of state and federal funds. Reviews are designed to ensure funds expended through third party agreements are used efficiently, effectively and in compliance with the terms and conditions of the contract as well as relevant laws and regulations.

SCDOT Selection Committee - A group of knowledgeable individuals and technical experts appointed by the appropriate Deputy Secretary to be responsible for the evaluation and ranking of consultant proposals and a consultant selection recommendation.

SCDOT Negotiation Team – A group of knowledgeable individuals responsible for the consultant negotiation and led by a Contracting Officer for Contract Negotiations.

Scope of Services: - All services, work activities, and actions required of the consultant by the obligations of the contract.

Specific Rates of Compensation Payment Method: A method of payment that provides for reimbursement on the basis of direct labor hours at specified fixed hourly rates (including direct labor costs, indirect costs, and fee or profit), generally referred to as loaded labor rates, plus any other direct expenses or costs, subject to an agreement maximum amount. This method of payment is suitable where the magnitude of service is uncertain but the character of services is known and a cost per hour can be determined. As such, the "specific rates of compensation" method establishes a loaded, fixed hourly rate up front which will not change for the duration of the contract (although escalation can be included in the agreement for multi-year contracts) and provides reimbursement to the consultant based on the labor hours worked.

This payment method is typically used when it is not possible at the time of procurement to estimate the extent or duration of the work or to estimate costs with any reasonable degree of accuracy and should be limited to contracts or components of contracts for specialized or support type services where the consultant is not in direct control of the number of hours worked, such as construction engineering and inspection.

Task Order - An order issued for a definite scope of work to be performed pursuant to an On-Call Contract without established rates.

Work Order - An order issued for a definite scope of work to be performed pursuant to an On-Call Contract with established unit rates.

APPENDIX B: SOURCE MATERIAL

Federal Highway Administration: Procurement, Management, and Administration of Engineering and Design Related Services – Questions and Answers, Last Updated March 2, 2012.
http://www.fhwa.dot.gov/programadmin/172qa.pdf

Federal Register, A Rule by the Federal Highway Administration: Procurement, Management, and Administration of Engineering and Design Related Services on 5/22/2015 (Final Rule)
https://www.federalregister.gov/articles/2015/05/22/2015-12024/procurement-management-and-administration-of-engineering-and-design-related-services

Florida Department of Transportation (FDOT), Negotiation Handbook: Professional Services Contracts, (Last Updated 9/16/2015): http://www.dot.state.fl.us/procurement/pdf/negot.pdf

North Carolina Department of Transportation (NCDOT), Policies and Procedures for major Professional or Specialized Services Contracts – 10/8/2009
https://connect.ncdot.gov/projects/Roadway/Private%20Engineering%20Firm%20Resources/Policies%20and%20Procedures.pdf

South Carolina Department of Transportation (SCDOT) manual for Procurement and Administration of Architectural & Engineering Services (Current Draft under review)

Tennessee Department of Transportation (TDOT), Standard Procurement Policy for Engineering and Technical Services – Policy Effective 5-1-2013:
https://www.tn.gov/assets/entities/tdot/attachments/Policy301-01.pdf

Virginia Department of Transportation (VDOT) , 2009 Manual for the Procurement & Management of Professional Services, Revision [3] – July 1, 2012
http://www.virginiadot.org/business/resources/ipd/2009_Manual_Revison3_12JUL01_Cleancopy.